

## Huntington Beach Fire Department

### Soil Clean-Up Standard

#### INTRODUCTION

In an attempt to restore hydrocarbon contaminated soil to a clean condition and to protect the health and safety of the community, the City of Huntington Beach maintains standards for soil clean-up.

The establishment of this standard was based on review of all applicable Federal, State and County statutes, which pertain to the regulation of petroleum contaminated soils.

In conclusion, the proposed standards, made a part of this Executive Summary, represent a recommendation to relax the existing City of Huntington Beach standards in respect to Total Petroleum Hydrocarbon (TPH) concentration while enhancing their scientific merit through the establishment of new criteria, which relate to specific chemical species. The Huntington Beach standard is in line with neighboring Southern California oil field communities and protects the health, safety and welfare of the residents and their environment while minimizing the hardship on the development interests of the City and its property owners.

#### 1ST CLEAN-UP CRITERIA

Soils sampled during site assessments that fail California Assessment Manual (CAM) criteria for hazardous waste will be excavated and disposed of at a proper disposal site. Laboratory tests used in this determination are pH (EPA-9045), CAM Metals (total), and Volatile Chlorinated and Aromatic Hydrocarbons (EPA-8240) as described on Page 4 - Site Assessment and Laboratory Specifications.

#### 2ND CLEAN-UP CRITERIA

Comparison of the Total Petroleum Hydrocarbon (TPH) concentration in soils sampled during the site assessment shall be made with the screening criteria in Table 1. If the sample results meet the Table 1 criteria, no further testing or remediation work shall be required.

If the TPH exceeds the screening criteria, the laboratory will perform the additional analyses specified (EPA-8020, EPA-8270).

Further delineation of the contaminated soil through use of additional borings, additional trenches or by excavation and stockpiling must be performed to determine the lateral and vertical extent of soil exceeding Table 1 criteria. Samples obtained during this delineation will be analyzed for screening criteria listed in Table 1 (EPA-418.1 and EPA-8015). If sample results exceed the screening criteria in Table 1, the laboratory shall be instructed to run the

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analyses specified in Table 2 (EPA-8020, EPA-8270) unless the applicant chooses to excavate the contaminated soil to meet criteria in Table 1 without proceeding to further analyses specified in Table 2. Soils which contain less than the screening levels specified in Table 2 shall not be required to undergo soil remediation provided that EPA 418.1 and EPA 8015M Total Petroleum Hydrocarbon concentrations are less than 100% excess of Table 1 screening criteria levels.

<b>Table 1</b> <b>Screening Level for Hydrocarbon Clean-up</b>		
<b>Land Use</b>	<b>TPH (418.1)</b>	<b>TPH (8015M)</b>
Residential and Recreational	<500 ppm	<500 ppm
Commercial and Industrial	<1,000 ppm	<1,000 ppm
Roadway		
<ul style="list-style-type: none"> <li>• 0' – 4' Below Road Surface</li> </ul>	N/A	<1,000 ppm Total; <100 ppm of the <C14 component
<ul style="list-style-type: none"> <li>• Below Road Surface</li> </ul>	<1,000 ppm	<1,000 ppm

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<b>Table 2</b> <b>Screening Level for Hydrocarbon Clean-up</b>		
<b>Land Use</b>	<b>BTX &amp; E (8021)</b>	<b>PNA (8270)<sup>1</sup></b>
Residential and Recreational	B < 1.0 PPM T, X & E < 10.0 ppm individually	Each CAPNA < 0.5 ppm Total CAPNA's < 3.0 ppm
Commercial and Industrial	B < 1.0 PPM T, X & E < 10.0 ppm individually	Each CAPNA < 1.0 ppm Total CAPNA's < 6.0 ppm
Roadway		
<ul style="list-style-type: none"> <li>• 0' – 4' Below Road Surface</li> </ul>	B < 1.0 ppm T, X & E < 10.0 ppm individually	Each CAPNA < 1.0 ppm Total CAPNA's < 6.0 ppm
<ul style="list-style-type: none"> <li>• &gt; 4' Below Road Surface</li> </ul>	B < 1.0 ppm T, X & E < 10.0 ppm individually	Each CAPNA < 1.0 ppm Total CAPNA's < 6.0 ppm

<sup>1</sup> Based on CAPNA's found in Proposition 65 list in addition to benzo(g,h,i)perylene.

### DEPTH OF CONTAMINATED SOIL REMOVAL

Soil contamination in excess of the Tables 1 and 2 criteria extending deeper than 20 feet below ultimate finished grade or within five (5) feet of the groundwater table, whichever is shallower, and not exhibiting characteristics of material considered hazardous for disposal purposes, may be considered for non-remediation. Approval for non-remediation shall be by certification of the Fire Department and shall be issued with appropriate findings. The lateral and vertical extent of this contaminated material left in place shall be determined using Table 1 criteria. This extent shall be reported to the City and disclosed to subsequent property owners in a format approved by the Fire Department.

Surface structures within 100 feet of the lateral extent of the contaminated soil shall be built with vapor barriers in accordance with applicable City Specifications.

### DISPOSITION OF STOCKPILED SOIL

Soil that is stockpiled on-site as a result of criteria applied above can be evaluated for reuse on-site. The reuse options may include, but are not limited to, on-site remediation and re-sampling to meet the criteria in Table 1 and/or 2, or reuse of the soil as road subgrade where applicable. Specifications for reuse of crude oil contaminated soil as road subgrade are identified on Page 5.

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Soil that is planned for reuse on-site should be sampled at a frequency sufficient to adequately characterize the degree and composition of the contamination. A sampling plan shall be submitted to the Fire Department for approval prior to reuse.

### ON-SITE REMEDIATION

Soil can be remediated on-site as long as it does not exhibit any characteristics of material considered hazardous for disposal purposes. On-site remediation must comply with all applicable State, County, Federal and City regulations. Remediation activities shall be performed within a designated area. A remediation plan shall be approved by the Fire Department.

After soil is remediated and reused, the surface of the designated remediation area shall be tested in accordance with provisions identified herein above. A testing plan shall be submitted to the Fire Department for approval as well as a final report, which shall summarize the remediation efforts and post remediation test results.

### SITE ASSESSMENT AND LABORATORY SPECIFICATIONS

Analyses performed during site assessments of oil fields (other industrial or agricultural uses may require additional analysis) should include pH (EPA-9045), CAM Metals (total only, soluble if total exceeds 10 times STLC), Volatile Hydrocarbons (EPA-8240), Total Recoverable Hydrocarbons (EPA-418.1), Total Fuel Hydrocarbons (EPA-8015), Semi-Volatile Organics (EPA-8270) and Polychlorinated Biphenyls (EPA-8080).

Vertical limits of hydrocarbon contamination shall be assessed. Sampling shall extend to a depth sufficient to identify at least five (5) feet of uncontaminated soil or to a depth not greater than five (5) feet above the water table in cases where regional groundwater will be impacted by sampling operations.

If the landowner chooses to clean-up the site using screening criteria specified in Table 2, the laboratory analytical work may specify the re-analyses of samples exceeding screening criteria specified in Table 1. The shelf life for the samples must not be exceeded when the re-analyses are run.

The laboratory contract shall specify use of EPA Method 3630 as a clean-up procedure prior to soil analysis for CAPNA's using EPA-8270 if the 418.1 results show greater than 1,000 ppm.

Samples representative of a specific site should be obtained consistent with a Phase I historical review of the site. The sampling frequency will vary depending on potential for on-site contamination. Sampling should be targeted at identified or suspected contaminated locations on the site.

Sampling of areas not suspected to be contaminated shall be done on a random basis according to a Sampling Plan, which shall be approved by the Fire Department.

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The Sampling Protocol, both in terms of site-specific targets and other random sampling, should be formulated in cooperation with the Fire Department. The burden of demonstrating soil clean-up to established limits of contamination shall be the responsibility of the land owner. The Fire Department's approval of a Sampling Protocol shall be required.

A Site Auditor, as identified on Page 6, shall be a requirement placed on all significantly large oil field properties and on smaller properties where a reasonable large number of contamination sources are deemed to remain unsampled following completion of the approved Sampling Protocol. The requirement for a Site Auditor shall be at the discretion of the Fire Department.

Soil sampling shall be carried out using protocols approved by the California Leaking Underground Fuel Tank Manual and/or the Orange County Health Department.

Analytical results, which may be inconsistent or anomalous when compared to other sample data taken as part of the site assessment shall be made a part of the record although the landowner shall have the option of providing additional samples to clarify inconsistencies. The number and location of these samples shall be determined by the landowner.

**SPECIFICATIONS FOR REUSE OF CRUDE OIL CONTAMINATED SOILS  
AS ROAD SUBGRADE**

Soils must meet criteria listed in Table 1 and 2.

Reused soils must meet compaction requirements.

Reused soils shall be placed directly beneath the asphalt cap and underlying aggregate to a maximum depth of four (4) feet below the road surface. Fills deeper than four (4) feet must be approved by the Fire Department based on sufficient findings.

Potable drinking water lines must be surrounded by clean sand or gravel and approved and inspected by the appropriate City departments before burial in the roadway.

A detailed set of drawings must be submitted to the City showing the plan view of reused soils, a cross section of the road base, locations of utility lines and thickness of clean sand and gravel pack placed around these lines. Soil analysis data for the road fill must also be submitted which shall verify compliance with the standards listed in Table 1 and/or Table 2.

**Soil Clean-Up Standard****SCOPE OF CONTRACT SPECIFICATIONS FOR ON-SITE AUDITING  
DURING GRADING ACTIVITIES**

The Auditor shall be an independent environmental or geotechnical consulting company with adequate training to identify petroleum contaminated soils with field instruments and techniques described below. The Auditor shall be licensed by the State of California as a Registered Environmental Assessor.

Auditors will monitor grading activities for indicators that petroleum hydrocarbons may have contaminated the soils and shall be aware of the situations and procedures:

1. Soft spongy soils that become evident as heavy equipment travels over it.
2. Hydrocarbon odors emanating from the soil.
3. A reading of greater than 20 ppm on a hand-held organic vapor monitor (OVM) held three (3) inches from suspected contaminated soils. The meter shall be calibrated at least twice per day.
4. A small vial of solvent can be used to extract a small amount of soil. If the solvent becomes discolored, petroleum may be present.

If any of the indicators above are found, the Auditor shall devise a sampling program capable of ascertaining whether or not the waste is classified as hazardous. All sampling procedures shall be in accordance with the protocols established by LUFT and/or the Orange County Health Department. The contamination citing shall be made a part of the record and the Fire Department shall be immediately notified.

Sufficient samples shall be analyzed to characterize the vertical and horizontal extent of the potential contaminant. If samples exceed the screening criteria in Table 1, the soil must either be removed or reanalyzed and compared to criteria in Table 2. If the soil is determined to meet the Table 2 criteria, the soil can be incorporated into the fill. If it does not, the soil can be stockpiled for remediation and reuse or removed from the site.

A report documenting the observations made and samples obtained during grading shall be prepared. This report shall document compliance with the appropriate sections of Table 1 and/or Table 2 as applicable.

**Soil Clean-Up Standard****GLOSSARY AND EXPLANATION OF TERMS**

**Aromatic Hydrocarbons** – Hydrocarbons that contain one or more Benzene ring. The name comes from the fact that many of them (e.g., Pentane, Hexane, Heptane, Octane, Toluene, Styrene, and Decane, etc.) have strong, pungent aromas. All of these products are part of the Hydrocarbon family.

**BTX & E** – **B**enzene, **T**oluene, **X**ylene, and **E**thylbenzene. All are members of the hydrocarbon family. The “8021” heading in Table 2 refers to the EPA test number used to determine the screening levels.

**CAM** – **C**alifornia **A**ssessment **M**anual. CAM is a manual or list that is used to identify heavy metals that are found in soil or ground water samples. These types of heavy metals are the result of end-stage hydrocarbon production. The CAM manual that is recognized in the petroleum chemical field lists 17 different metals:

- |                   |                   |
|-------------------|-------------------|
| 1. Ag- Silver     | 10. Ni- Nickel    |
| 2. As- Arsenic    | 11. Pd- Palladium |
| 3. Ba- Barium     | 12. Sb- Antimony  |
| 4. Be- Beryllium  | 13. Se- Selenium  |
| 5. Cd- Cadmium    | 14. Ti- Thallium  |
| 6. Cr- Chromium   | 15. V- Vanadium   |
| 7. Co- Cobalt     | 16. Zn- Zinc      |
| 8. Cu- Copper     | 17. Hg- Mercury   |
| 9. Mo- Molybdenum |                   |

**CAPNA's** – **CA** is in reference to the regulations by the State of California, and **PNA** refers to **P**oly**N**uclear **A**romatic Hydrocarbons. Polynuclear Aromatic Hydrocarbons are associated with the process of oil production and could potentially be found in the soil or ground water of oil production areas.

**DTSC** – **D**epartment of **T**oxic **S**ubstance **C**ontrol.

**EPA** – **E**nvironmental **P**rotection **A**gency.

**Laboratory Tests** – The City Specification refers to the types of laboratory tests that are conducted to determine the pH level, CAM Metals (total), and the Volatile Chlorinated and Aromatic Hydrocarbons in any given soil sample. The acronyms listed (EPA-9045 and EPA-8240) are the recognized tests used by the Environmental Protection Agency (EPA) to find the levels of the specified agent (e.g., pH, CAM Metals, and various types of hydrocarbons). Several areas of this City Specification refer to these various types of EPA recognized tests. Each test carries a numerical reference number.

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**LUFT** – **L**eaking **U**nderground **F**uel **T**ank Field Manual. This provides guidance on procedures to address environmental concerns for water quality protection from gasoline or diesel leaks. The LUFT Manual was intended to approximate many complex phenomena that occur during the transport of all type of hydrocarbons.

**OVM** – **O**rganic **V**apor **M**onitor (OVM). This is a hand-held monitor that provides the capability of monitoring hydrocarbon families, as well as organic matter.

**PH** – Refers to the relative level of acidity or alkalinity of a solution.

**PPM** – **P**arts **P**er **M**illion. Refers to the relative concentration of a chemical contained within the sample.

**REA** – **R**egistered **E**nvironmental **A**ssessor. REA's are registered by the Department of Toxic Substance Control Registered Environmental Assessor Program (DTSC) to conduct and direct site mitigation and investigation activities at hazardous waste and hazardous substance release sites.

**STLC** – **S**oluble **T**hreshold **L**imits **C**oncentrations. This is a method of extracting elements from soil or ground water samples looking for Metals and Trichloroethene.

**TPH** – **T**otal **P**etroleum **H**ydrocarbon. Refers to the full range of total petroleum hydrocarbons including benzene, toluene, ethylbenzene, xylenes and the full suite of volatile organic compounds that can be found in any soil or ground water sample.

**VCH** – **V**olatile **C**hlorinated **H**ydrocarbons. Substances that readily evaporate at normal temperatures and pressures (e.g. benzene, toluene, ethylbenzene, and xylene) are also referred to as VCH.

APPROVED: \_\_\_\_\_  
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DATE: \_\_\_\_\_